Household Risk Coping Strategies: The Role of Self-Employment during the Asian Financial Crisis in Indonesia

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Introduction

- Stylized facts: Labor response to the Asian Financial Crisis in urban Indonesia:

  - Increase in total employment
  - Shift from wage employment into self-employment

- Self-employment sector played an interesting role:

  - Absorbed labor unemployed from the modern sector
  - Absorbed additional labor supplied by households during the crisis

Main Question

Did having self-employed business function as insurance during the crisis?

- Treating ownership of self-employed business before the crisis as an endowment, did this make household have:
  - Less decrease in consumption?
  - Less increase in labor supply?

Definitions

- Self-employment sector: Small household businesses
  (Fiess et al. (2010), Loayza and Rigolini (2011), International Labor
  Organization)

- Worker working in the self-employed sector: individuals reporting to
  be self-employed or family workers

Preview of Results

- Tested the magnitude of the insurance value of self-employed business during the crisis
  - Using difference in difference
- Found:
  - No effect on household consumption
  - Large negative effect on household labor supply
- Substantial insurance value:
  - Smaller increase in labor supply to maintain the same level of consumption
- Deepened understanding of the self-employed sector during aggregate shocks

Motivation: Why ask this question?

- First step to analyze a potential risk managing strategy for urban households in developing countries:
  - Diversification between wage employment and self-employment

- Urban self-employed sector is a large sector in developing countries, yet understudied:
  - Analyzing its insurance role is an interesting angle

- Self-employment is highly correlated with traditional(informal) employment
  - Adds to the policy debate regarding treatment of the traditional sector

Policy Implications

- Two views on the traditional (informal) sector:
  - Negative: Backward with low productivity, less efficient, limited potential for growth
  - Positive: An engine for employment generation

- This analysis adds another positive role:
  - Insurance against volatility in the modern(wage) sector

- Policies intended to improve job and income security such as unemployment insurance in the wage-employment sector may
  - Change households' incentive to diversify
  - Potentially reduce the size of the self-employed sector

Literature: Informal Sector

- Literature explaining the existence of a large informal sector and the formal-informal earning gap in developing countries:
  - Formal sector entry barrier and rationing (Harris and Todaro (1970))
  - Voluntary choice based on comparative advantage (Gindling (1991); Maloney (1999); Maloney (2004))

- This paper adds a third explanation: Insurance against shocks in the formal sector

Literature: Risk and Insurance

- Diversification of income generating activities in development literature:
  - Diversification between farm and non-farm activities in rural areas (Reardon (1997); Townsend (1994); Dercon (2002))
  - Diversification in location of land plots and type of crops grown in rural areas (Morduch (1990); Dercon (1996))

- This paper studies one of the risk managing strategy used by urban households in developing countries:
  - diversification between wage employment and self-employment

Model

- Household maximize discounted life-time utility by allocating labor and consumption in each period
- Utility depend on consumption as well as leisure
- Households allocate adult members into wage employment, self-employment and not working
- Returns in wage employment and self-employment are subject to uncertainty
- The shocks to wage employment and self-employment are not perfectly correlated
- There is an entry cost into self-employment

Predictions of the model

- Households have an incentive to diversify
  - Evidence ▶

- When wage employment return is hit harder than self-employment:
  - Due to entry cost, having self-employment before the shock will benefit households in terms of bigger consumption or less work

  – Will show the Asian Financial Crisis in Indonesia is such a shock
  – Will estimate the effect of prior self-employment on household consumption and work during the crisis

Data: Indonesian Family Life Survey 1

- Household level panel data with very low attrition, 7000 households, representative
  - Ideal for analyzing changes during crisis, useful for controlling for unobserved characteristics

- Four rounds: 1993 1997 2000 2007
  - 1997 right before crisis, 2000 during crisis, 1993 and 2007 useful to analyze pre-crisis and post-crisis trends

- Have income information not only for wage earners but also for self-employed workers
  - Possible to compare change in return in the wage sector and self-employed sector

Data: Indonesian Family Life Survey 2

- Have detailed information on both household consumption and work
  - Possible to look at change in consumption and work for the same household at the same time

- Have detailed information on household self-employed business
  - Useful to understand basic characteristics of self-employed business in Indonesia

Data: Labor Force Survey

- Annual cross section survey 1986-2011
  - Possible to analyze long term trend and deviation of trend during the crisis

- Large sample size
  - May be more representative than the Family Life Survey

- Only has work related information, no information on consumption
  - Not used for the empirical test

What are self-employed businesses in urban Indonesia like?

Table : Main characteristics of urban non-farm businesses in Indonesia

Operating outside home	52%
Without any kind of permit	89%
In restaurants and food sales	29%
In non-food sales	30.5%
In tailor and hairdressing	12%
Single person business	40%
With less or equal to 5 workers	95%
With paid employee(s)	16%
Median of starting capital*	1.26
Mean of starting capital*	8.57

*In terms of monthly consumption per member for the same household
Source: IFLS4

What happened during the crisis?

- Sharp depreciation of the Rupiah `▶ Graph`

- Removal of rice price subsidy and sharp increase of food and other prices relative to wage-sector wage `▶ Graph`

- Decrease of production of many formal sector firms

- Decrease of real GDP by 15% `▶ Graph`

Labor market response to such a crisis?

Increase in total employment and shift from wage into self-employment:

Table : Percentage of Urban Individuals with Different Employment Status

	1993	1997	2000
Wage employment	34.83	33.8	30.21
	[33.44, 36.24]	[32.41, 35.21]	[28.87, 31.59]
Self-employment	30.34	30.7	38.42
	[29.01, 31.71]	[29.35, 32.08]	[36.99, 39.87]
Not working	34.83	35.51	31.37
	[33.44, 36.24]	[34.1, 36.93]	[30.02, 32.76]

Data source: IFLS1 IFLS2 IFLS3, panel respondents, numbers in brackets are 95% confidence intervals

Confirming the shift from wage into self-employment using Labor Force Survey

Figure : Wage Employment vs. Self-Employment Urban 1986-2000
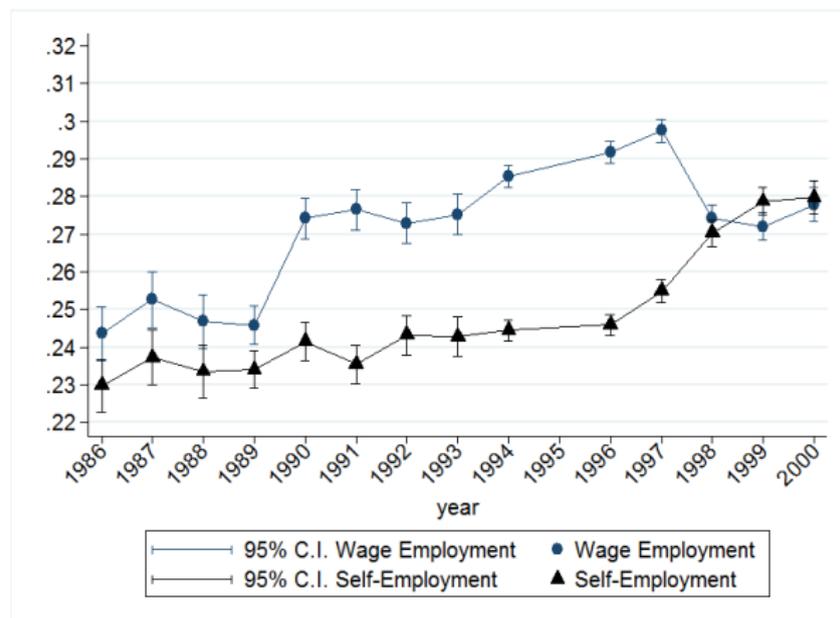
The shift indicates that self-employment was more resilient, but why?

- Self-employed sector uses much less imported inputs
  – Less hit by currency depreciation

- Self-employed sector borrows much less in the formal financial sector
  – Less hit by the financial sector crisis and currency depreciation

- Self-employed sector mainly meets basic everyday needs
  – Demand less hit by economic crisis

Do we see a smaller hit in the self-employed sector reflected in income?

Income (monthly profit) in self-employed sector did seem to be hit less than income (monthly wage) in wage sector compared to trend

Table : Mean of Change in Ln Monthly Real Income (%)

Period	Sector	
	Self-Employed	Wage-Employed
1993-1997	11.54	20.01
	[4.34]	[1.62]
1997-2000	-6.99	-8.85
	[3.37]	[1.44]
2000-2007	4.02	29.25
	[3.5]	[1.68]

Source: IFLS, Used provincial level inflation from BPS, number in [ ] is standard error
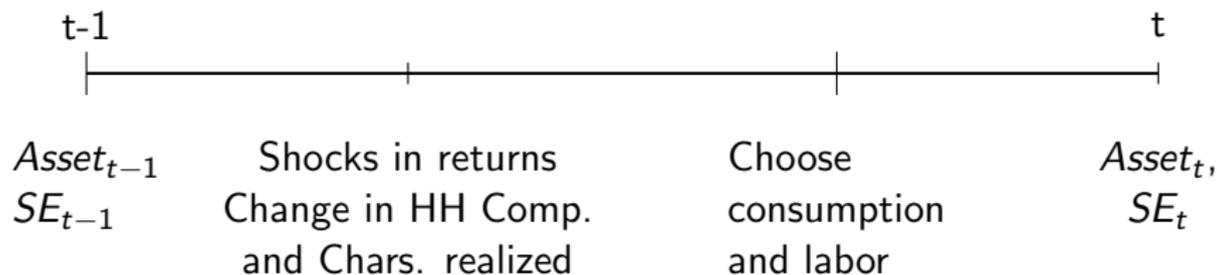
Higher risk of unemployment in wage sector during crisis?

Table : Percentage of Households that had a Economic Shock

Type of household (Type of shock)	All Wage Lost a job	All Self-Emp. Failed a business
Period 1994 and 1995	1.51	2.82
	[1.02, 2.25]	[1.85, 4.29]
Period 1998 and 1999	5.17	1.7
	[4.14, 6.43]	[0.95, 3.02]

1. Source: IFLS2 and IFLS3

2. The numbers in brackets are 90% confidence intervals

Empirical Strategy: Decision Timing

t-1			t

$Asset_{t-1}$ Shocks in returns   Choose $Asset_t$,
SE_{t-1} Change in HH Comp.   consumption SE_t
     and Chars. realized   and labor

Only have 1993, 1997, 2000 - treat these points as decision points

Empirical Strategy: Estimated Equation

Treat 1993, 1997 and 2000 as decision points, want to estimate

$$y_{2000} = \alpha_0 + \alpha_1 SE_{1997} + \alpha_2 X_{2000} + \alpha_3 Z + \tau_{2000} + \epsilon_{y_{2000}} \tag{1}$$

Interested in α_1: Effect of Prior Self-employed Business on outcome variables

Empirical Strategy: Independent Variables

- X include:
  - Education, age, gender composition - Affect returns in both sectors
  - Value of total non-business asset - Affect budget constraint

- Z is unobserved household char. such as entrepreneurial abilities
  - Affect returns in either sector

- τ_{2000} is the average effect of the crisis on y_{2000}

Estimated Equation cont.

- Outcome variables y include
  - Household per capita monthly real consumption: total consumption including education, health, durables
  - Percent of adult members (older than 15) who report working in the last week
  - Percent of adult members (older than 15) who report working in the last year
  - Total hours worked by all adult household members in a normal week

- Also control for province indicator variables

Endogeneity

Have endogeneity problem because

$$SE_{1997} = \beta_0 + \beta_1 SE_{1993} + \beta_2 X_{1997} + \beta_3 Z + \epsilon_{SE_{1997}} \qquad (2)$$

Empirical Strategy: Difference in Difference

Compare the following two groups of households

	Control	Treatment
Have self-employment in 1993?	No	No
Have self-employment in 1997?	No	Yes

Then for both groups

$$y_{2000} = \alpha_0 + \alpha_1 SE_{1997} + \alpha_2 X_{2000} + \alpha_3 Z + \tau_{2000} + \epsilon_{y_{2000}} \qquad (3)$$

$$y_{1997} = \alpha_0 + \alpha_2 X_{1997} + \alpha_3 Z + \epsilon_{y_{1997}} \qquad (4)$$

So:

$$\Delta y_{1997-2000} = \alpha_1 SE_{1997} + \alpha_2 \Delta X_{1997-2000} + \tau_{2000} + \Delta \epsilon_{y_{1997-2000}} \qquad (5)$$

Assumption for consistency

- Main assumption: household unobserved characteristics don't change over time
  - Estimate same equation for intact households to have a check on this assumption

    - The main adult members (between 15 and 60) of the household did not change between 1993 and 2000

- Other assumptions:
  - All relationships are linear
  - Abstract from idiosyncratic shocks
  - Household expectations of shocks don't change over time
  - Shocks in 1993-1997 are not correlated with shocks in 1997-2000

Samples of estimation

Estimate Equation 5 on three samples:

1. Full sample

2. Households that were intact

3. Households with hours information

Descriptive Statistics

Table : Household Chars. for Control and Treatment Group

	Level 1997		Change 1997-2000	
Groups	Control	Treatment	Control	Treatment
HH Size	**4.26**	**4.94**	0.1	-0.24
% elementary	**31.92**	**40.04**	-2.6	-4
% sr. sec.	**31.84**	**26.69**	1.53	0.53
% post sec.	**11.01**	**7.23**	2.1	1.9
real per capita consumption	**117523**	**96431**	-4204	-1831
% working last week	**51.11**	**68.4**	**7.04**	**-4.96**
% working last year	**51.47**	**61.14**	**5.07**	**-1.84**
% missing hours	15.86	12.96	21.11	19.45
hours normal week	**76.9**	**101.57**	**24.59**	**16.46**

Results: Estimates of α_1 from Equation 5

Much smaller increase in labor supply to maintain same level of consumption if have prior self-employment:

Sample	N	Ln of real per capita consumption	Percent of adults who work last week	Percent of adults who work last year	Hours worked normal week
All	736	-0.0576	**-9.501*****	**-5.660***	
		(0.0503)	(2.534)	(2.535)	
Intact	277	-0.0267	**-10.11***	**-9.707***	
		(0.0786)	(4.114)	(3.952)	
With Hours	583	-0.0631	**-4.970***	-2.169	**-12.99***
		(0.0528)	(2.424)	(2.448)	(5.500)

Discussion of results

- Why don't we see as big an effect for households with hours information?

  – People with hours information have more secure jobs

- Secular trend of modern and traditional families converging towards each other?

  – Both groups started with being a modern family

Discussion of results continued

Why don't we see an effect on consumption?

– Maybe consumption has recovered by 2000
– Or consumption was smoothed well during crisis

Table : Estimate of τ_{2000} - the effect of crisis

	(1) Ln of Real Per Capita Consumption	(2) Percent of Adults who Work Last Week	(3) Percent of Adults who Work Last Year
All Households	-0.0469 (0.0267)	6.721*** (1.347)	5.079*** (1.345)

Conclusion

- Analyzed the insurance role of the self-employed sector during the Asian Financial Crisis in urban Indonesia
- Found large insurance value in terms of a much smaller increase in labor supply

Future work:

- Effect of prior self-employment on other outcome variables during the crisis, e.g. education, health
- Other measures of self-employment
- Insurance role of self-employment during non-crisis times
- Option to switch into self-employment when hit by wage employment shocks as another form of insurance

Other coping strategy: Selling assets

Table : Change in Ownership and Value of Assets for Urban Households 1997-2000

Asset type	Change of ownership				Know asset value	Change in asset value
	Sold all	New owner	Kept some	Never own		
House	6.03	6.55	72.23	15.20	86.46	-1186650
						[310932]
Building*	8.37	9.03	7.68	74.91	94.31	-149796
						[96123]
Land	16.06	10.51	8.55	64.89	93.63	-429843
						[88814]
Vehicles	16.06	13.03	41.39	29.53	95.62	39197
						[46623]
Appliances	5.66	5.86	82.59	5.90	92.28	98013
						[12246]
Savings	13.51	17.13	19.06	50.31	87.84	57472
						[18316]
Receivables	8.24	9.03	3.00	79.74	96.55	10269
						[5849]
Jewelry	16.07	17.28	46.34	20.31	88.22	9796
						[8051]
Furniture	1.00	3.00	95.55	0.45	87.94	61606
						[11794]

Data Source: IFLS2 and IFLS3. *Building not occupied by the household

# Other coping strategy: Change in household composition - Urban

Table : Annual Hazard Rate (%) of Having at Least One Member Moving

Reason	Move In		Move Out	
	1993-1997	1997-2000	1993-1997	1997-2000
Death			2.61	2.99
Birth	6.65	5.45		
Follow spouse/parent	1.13	2.81	2.52	4.18
Work	0.91	1.48	4.04	4.30
Marriage	1.98	1.91	3.69	3.49
School	0.60	0.95	1.79	2.08
Need place	1.03	2.08	0.73	2.04
Other	2.00	1.95	2.01	2.31
Total*	7.09	9.42	12.59	15.05

Data source: IFLS1, IFLS2 and IFLS3. * Total includes all reasons except death and birth. Urban households ▶
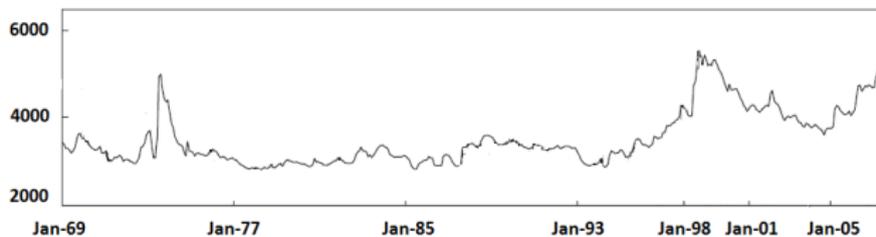
Increase of labor supply and shift of labor from wage sector into self-employed 2005-2008 - Labor Force Survey

Figure : Wage Employment vs. Self-Employment Urban 2001-2011
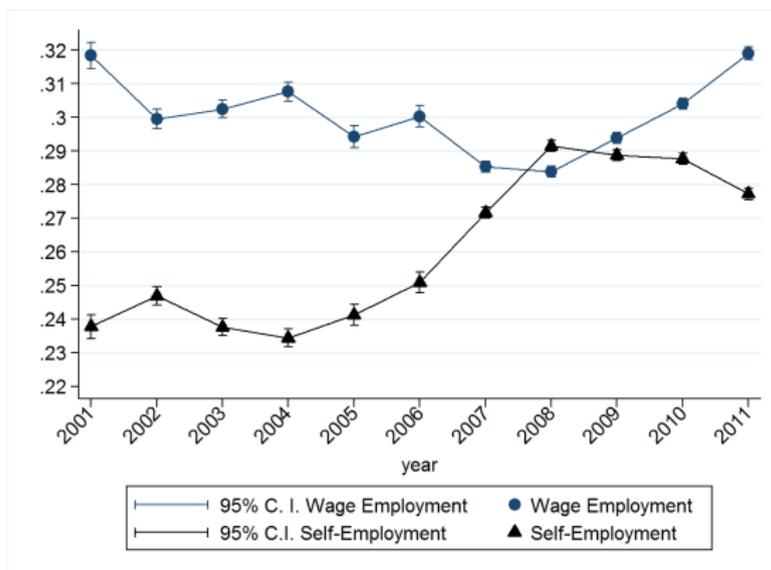
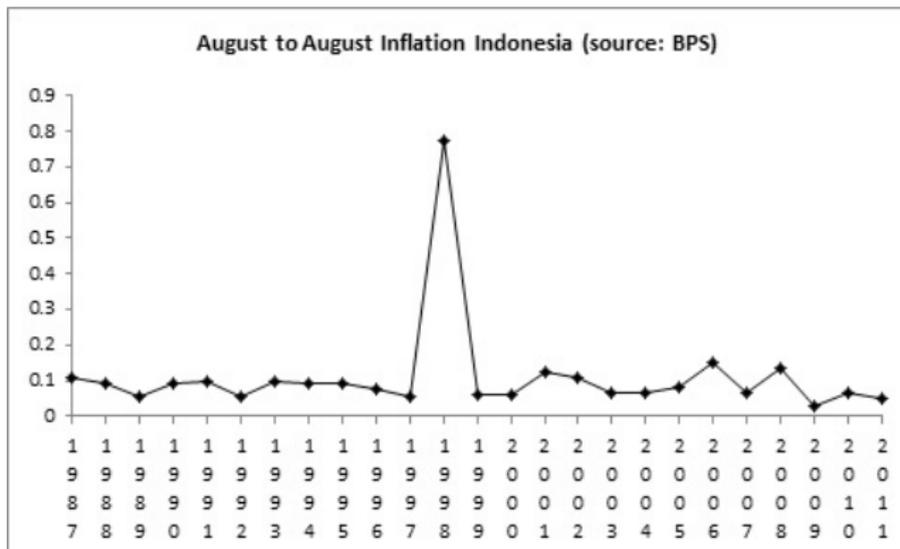Coincides with another period of (▸ rice price increase) and (▸ high inflation)

Chang in Rice Price

source: Dawe 2008 (▸ Back2)

Inflation over Time

August to August Inflation Indonesia (source: BPS)
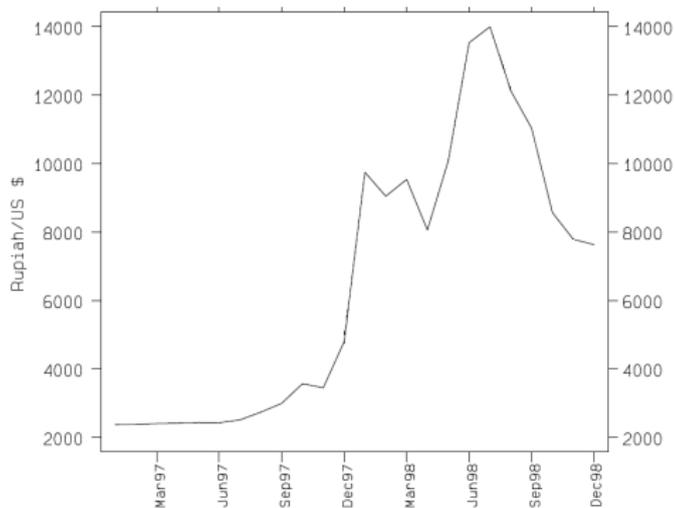
source: Indonesia Statistics Bureau (• Back2)

Household Diversification

Table : Households in Different Labor Allocation Categories (%)

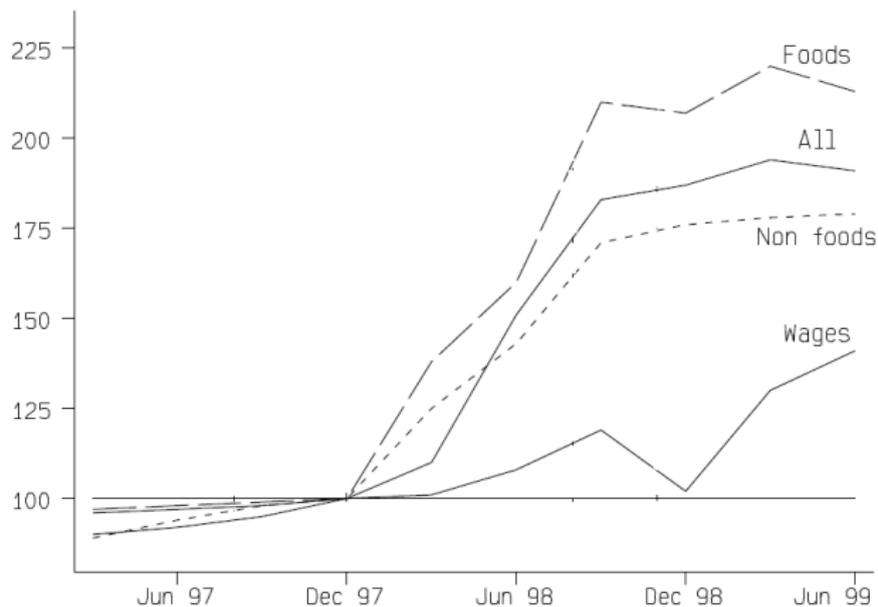| Category	Only Wage	Only Self-Emp	Both
	55	26	24

Exchange Rate Fluctuation

source: Frankenberg et al., 2002

Back

Change of price and wage

source: Frankenberg et al., 2002 ▸ Back

Real GDP Per Capita Over Time

INDONESIA GDP PER CAPITA
GDP Per Capita in US Dollars at Constant Prices Since 2000

source: World Bank ▸ Back